

What is claimed is:

1. A method for controlling a concentration of an electrolytic solution for making an electrolytic treatment of a metallic material, comprising steps of:

5     measuring a acid concentration of acid in said electrolytic solution;

      measuring a salt concentration of salt which is generated by ionizing part of said metallic material in said electrolytic solution in said electrolytic treatment; and

10     adding at least one of a diluting liquid and a fresh acid according to said measured acid concentration, said measured salt concentration, and a current value of said electrolytic current supplied during said electrolytic treatment.

15     2. A method as claimed in claim 1, further comprising a step of calculating a feed cycle of adding a predetermined amount of said diluting liquid from said measured salt concentration and said current value.

20     3. A method as claimed in claim 2, further comprising steps of:

      calculating a difference from said measured acid concentration to an objected acid concentration; and

      adding said fresh acid to said electrolytic solution when  
25     said difference is larger than a predetermined limit value.

      4. A method as claimed in claim 2, wherein when said current value is  $I$ , and  $A$  and  $B$  are optional constants, a standard cycle  $T_0$  for adding said diluting liquid to said electrolytic solution  
30     is  $T_0 = A/I + B$ ,

      and wherein when said measured salt concentration is  $PV_a$ ,

said objected salt concentration is  $SV_a$ , and C and D are optional constants, said feed cycle T for adding the predetermined amount of said diluting liquid is,

$$T = T_o \times (1 + C \times (PV_a - SV_a)) + D.$$

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5. A method as claimed in claim 4, wherein said metallic material is an aluminum plate used for a substrate of a PS plate.

6. A method as claimed in claim 5, wherein said acid is  
10 hydrochloric acid.

7. An apparatus for controlling a concentration of an electrolytic solution in which an electrolytic treatment of a metallic material is made, comprising:

15 an acid concentration meter for measuring an acid concentration of acid contained in said electrolytic solution;

a salt concentration meter for measuring a salt concentration of salt which is generated by ionizing part of said metallic material in said electrolytic treatment;

20 a current meter for measuring a current value of said electrolytic current supplied during said electrolytic treatment;

an acid concentration controller for controlling said acid concentration, said acid concentration controller adding a  
25 fresh acid to said electrolytic solution on the basis of a measured acid concentration and an objected acid concentration; and

a salt concentration controller for controlling said salt concentration of said metallic salt, said salt concentration  
30 controller calculating a controlling period of said salt concentration on the basis of a measured salt concentration and

said current value, to add a diluting liquid to said electrolytic solution at each controlling period.

8. An apparatus as claimed in claim 7, wherein when said  
5 current value is  $I$ , and  $A$  and  $B$  are optional constants, a standard cycle  $T_0$  for adding said diluting liquid to said electrolytic solution is  $T_0 = A/I + B$ ,

and wherein when said measured salt concentration is  $PV_a$ ,  
said objected salt concentration is  $SV_a$ , and  $C$  and  $D$  are optional  
10 constants, said feed cycle  $T$  for feeding said diluting liquid is,

$$T = T_0 \times (1 + C \times (PV_a - SV_a)) + D.$$